The Maryland Fruit Grower

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College Park, Maryland

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Niagara

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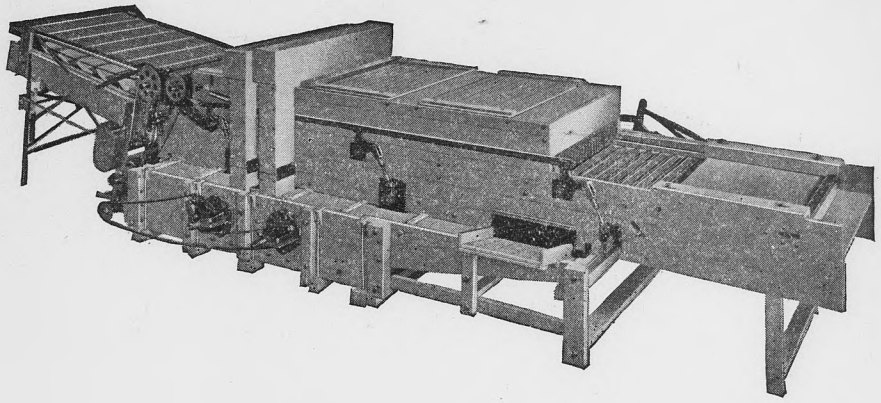

FRUIT WASHERS

The present-day fruit washer should not only remove all spray residues, but all other residues from the surface of the fruit, including dust, dirt, aphis and leaf hopper blemishes, in fact, everything that detracts from the appearance of the fruit.

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The Cutler-Moe Fruit Washer not only removes all residues mentioned above, but imparts a beautiful finish to the natural wax of the fruit. This bright appearance should not only bring better prices, but also quicker sales which, in years of heavy crops, is an all-important factor.

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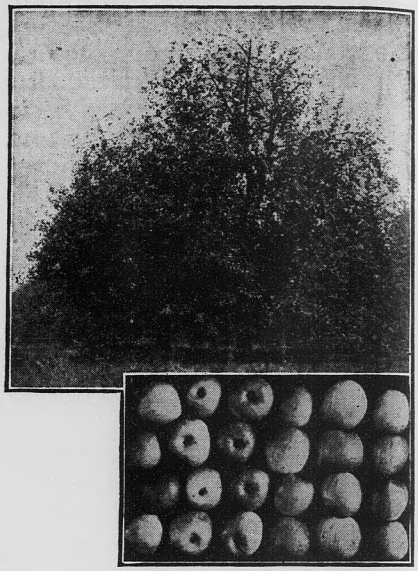

Photograph of an apple tree sprayed with Koppers Flotation Sulphur. Note the healthy condition of foliage and grade A fruit.

KOPPERS PRODUCTS CO.

Koppers Bldg Pittsburgh, Pa.

JUST AMONG OURSELVES

A. F. VIERHELLER

This issue of the Maryland Fruit Grower is devoted to "Packing and Washing Equipment," so that you can think these matters over between now and harvest. The question of fruit washing is rather new, and the articles on fruit washing are presented, not to persuade every grower to wash his fruit, but to keep him posted on developments in this field.

Members

There's plenty of room for more members in the Maryland State Horticultural Society. The dues are low. One dollar a year. Let's all try to get some of the neighbors to join. The Society should represent every Maryland fruit grower, no matter what his acreage may be. We must work together for our common good. Remember the banana. As soon as it leaves the bunch, it gets skinned.

The Filler Tank

Many growers are using filler tanks, which are simply wood or metal tanks mounted on a truck or wagon gear, and their use is to haul water and spray mix to the spray machine, out in the orchard. By using filler tanks, the sprayer is kept going and is not dragged around, empty, half the time. Usually the filler is mounted high, so that the sprayer can be filled by gravity. The lime sulfur is added to the filler tank before going to the field, and lime and lead arsenate are placed in the spray machine tank after the lime sulfur mixture is run into the tank from the filler. Always add arsenate of lead the last thing, where used with lime sulfur. Where Bordeaux is used, it is best to haul the water to the sprayer, and mix in the Bordeaux and lead arsenate as the sprayer tank is being filled. One grower using the filler tank claims that it has doubled the spraying capacity of each spray machine.

Here's Our Old Friend—Blotch

After dodging through the season of freeze, scab and uncertainty, the apple grower can now look forward to blotch and spray burn. Blotch is a warm weather disease, and seems especially fond of Gano, Northwestern Greening, Grimes, Stark and Duchess. The spores of blotch live over on the roughened scaly cankers on the bark and are washed onto the leaves and apples during May and June. It is impossible to cut out all cankered wood, so that thorough coverage of Bordeaux, 4-8-100, is our best hope of control.

Argentine Apples

The June, 1931, issue of the Maryland Market News Letter, published by the State Department of Markets, outlines the import regulations for apples shipped to Argentina. According to the Maryland News Letter, American apples may be shipped from May 1 to December 15 in "containers of standard types adopted by the exporting country," which means that barrels or bushel baskets will be accepted packages. Each apple must be wrapped in "specially prepared paper" upon which is stamped the name of "the grower

or packer," and the country of origin. The oiled paper wrapper, properly stamped, will be accepted.

The fruit must go to Argentina under refrigeration, and must have a sanitary certificate showing the fruit to be free from parasites. All shipments will be inspected upon arrival, and placed in quarantine if presence of any parasites is suspected. The quarantined fruit will be released when sanitary officers feel that it is safe for the fruit to be marketed.

The presence of blotch, canker, brown rot, soft rot, Mediterranean fruit fly, apple curculio, apple fruit miner, apple maggot and apple weevil, will mean that the whole shipment will be burned, without any indemnity payment to the importer.

If there are any other injurious parasites present, not including those named above, the fruit will not be allowed to enter the country, but will not be destroyed by the sanitary officials, if it is reshipped immediately.

Full particulars of the Argentine regulations may be had by writing to the Maryland State Department of Markets, College Park, Maryland.

Probably the editor of the West Virginia Horticultural Society's Mountaineer Grower, had just read some foreign regulations when he wrote, "Apples are handled as though they were worth a million dollars. They are sprayed over by the grower; prayed over by his wife; and preyed upon by the buyer. They are nitrated, freight-rated, and berated. They are thinned, washed, rinsed, sized, wiped, blown upon, polished, faced, labeled, and selected. Then they are inspected, insected, dissected and rejected!"

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"The Maryland Fruit Grower"

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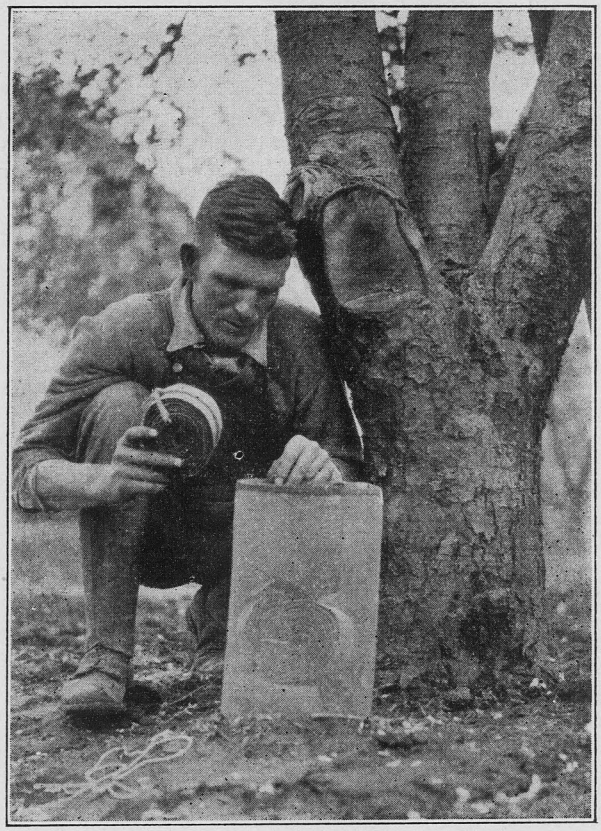

Figure 1: William Watson, Berlin, examining a type of codling moth cage that is being used for spring emergence records on the Eastern Shore this year. (Photo by H. A. Hunter.)

* * *

WHAT THE CODLING MOTH IS DOING

by

P. D. SANDERS *and* C. GRAHAM
Department of Entomology, University of Maryland

In order to spray intelligently for codling moth control it is not sufficient that the apple grower have a general idea of the life history of the insect; he must, in addition, be familiar with what it is doing that particular year. He must know when the moths begin to emrege from their winter hiding places in his section and start depositing their tiny white eggs on the apple foliage. It is also essential that he know the time these eggs hatch into the little worms that are destined to eat apple or arsenic and the length of time

this hatching and worm entrance continues. If he knows these facts, it remains only for him to keep his trees thoroughly covered with arsenate of lead during the period they suggest.

The Department of Entomology of the University of Maryland is making special effort to check on codling moth activity at five different points in the State this year, by placing corrugated pasteboard bands containing the overwintering worms inside screen wire cages during the dormant season, and making daily records on codling moth emergence from them this spring. Figure 1 shows the type of cage being used on the Eastern Shore. The moths are taken from the cages each day and the number recorded. The results of these counts are shown in the following table.

TABLE 1—*1931 Daily Codling Moth Emergence Records to June 8th.*

MAY	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Hancock	0	0	0	0	1	1	3	1	5	8	7	15	0	6	13	33	36	50	37	29	25
College Park	0	0	0	0	0	1	1	1	2	8	11	10	0	10	14	6	10	7	15	21	39
Easton	0	0	0	0	0	0	0	2	5	8	17	12	3	3	27	15	19	22	17	9	11
Salisbury	2	0	0	2	0	0	6	6	9	24	50	42	17	5	5	43	26	27	21	26	40
Berlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	15	14	14	28	23

JUNE	1	2	3	4	5	6	7	8
Hancock	1	10	12	8	11	14	8	0
College Park	0	20	14	14	44	40	44	22
Easton	2	6	11	15	16	38	41	11
Salisbury	37	10	21	37	58	51	56	50
Berlin	12	5	15	29	24	15	48	34

TABLE 2—*The Daily Emergence Shown in Table 1 Grouped at Five Day Intervals to Eliminate Daily Fluctuations.*

	May 10-14	May 15-19	May 20-24	May 25-29	May 30-June 3	June 4-8
Hancock	0	11	36	169	77	41
College Park	0	5	39	52	94	164
Easton	0	7	43	97	39	121
Salisbury	4	21	138	122	134	252
Berlin	0	0	0	49	83	150

In the Hancock section emergence began on May 15th and reached its peak between May 25 and 29. They are still emerging there in considerable numbers.

At College Park the first moth came out on May 16 and have increased in abundance almost daily until the peak was reached between June 4 and 8. There have been daily fluctuations associated with the temperatures.

At Easton emergence did not begin until May 18, with the greatest number of moths appearing between June 4 and 8. This cage is located in Orchard Knob near the bank of the Choptank River, which is cooled by a stiff breeze nearly all spring. Perhaps this has been a factor in retarding the codling moth. The cold weather around June 1 was responsible for the slump in emergence between May 30 and June 3.

As would be expected from tree development, the emergence from Salisbury was first for the entire state. The first moths emerged there May 11

and have continued with slight fluctuations. The peak to date was between June 4 and 8.

The cage at Berlin is located less than two miles from the water front which again has shown a tendency to hold back the moths. Another factor which retarded emergence there was lack of rainfall prior to May 23. Emergence began on May 26, the first warm day following the rain. The peak to date was June 4 to 8.

A SUGGESTION

The warm days during the first week of June caused egg hatching in practically every section of the state. Trees that were sprayed during that period should be protected from the first worms to hatch (the forerunners of the second brood). But emergence, egg laying, and hatching have continued every day, and here is the "tip," *keep those apple trees covered with arsenate of lead until three or four weeks after the emergence is over.* These moths live and continue egg laying for two or three weeks. The eggs hatch in about 7 days. Spray thoroughly every two weeks.

Omit arsenate of lead on early varieties after June 15 or 20.

* * *

FRUIT CLEANING EQUIPMENT, PAST, PRESENT AND FUTURE

H. G. INGERSON, *Iansing, Michigan.*

Past

The history of fruit cleaning equipment goes back many years, as citrus fruits have been both washed and polished for a long time. The cleaning of apples, pears and peaches is of more recent development and naturally, the early types of equipment for this purpose were adaptations of citrus equipment. Different types of brush cleaners and polishers were used in California and the Pacific Northwest on apples as early as 1923, and this type of equipment came into very general use in those sections in 1925 and '26.

At that time the domestic tolerance on spray residue was .0275. This was reduced materially in 1926 and the new tolerance established brought dismay to the Northwest apple growers when tests showed that the dry type of cleaners in many cases failed to bring the fruit under the new tolerance. Naturally, the next step was to try moistening the fruit and when water alone proved inadequate, chemicals of different natures were added. These included soap, alkalies, and acids, in fact a whole list of materials that might prove beneficial were tried. During the 1926 season, the practice of using dilute hydrochloric acid was quite well established in the Northwest districts. The tests were made with small improvised units of equipment, either adopted from citrus washing or improvised locally.

The early models of washers included the immersion type, in which the fruit was carried through some type of vat, either loose or in orchard containers, and some of this fruit was immersed to a depth of 10 to 12 inches. By leaving the fruit in solution several minutes and then removing, and in turn immersing in clear water, the residue was usually reduced to the government tolerance. When this fruit was put into storage and later on the market, some cases of fruit injury were found. This took several forms,

such as blackening at the core, due to the deep submersion of the fruit, actual burn on the skin and flesh of the fruit and the typical arsenical burn about the calyx and where rinsing has been inadequate. These were some of the difficulties encountered the first year.

At this time manufacturers of fruit handling equipment became actively interested in helping solve the problem of removing spray residue. It was realized that the future of the Northwest apple industry hung in the balance and all of the industries dependent on profitable production of apples in these districts were naturally concerned about their futures. The best engineers together with the chemists, fruit packers and sales agencies, worked together to develop equipment suitable for the requirements of their districts. The season of 1927 brought a somewhat improved condition with improved types of washing equipment, using the so-called flood wash, and the diffused spray wash. Better provision was made for rinsing, and dryers were provided as definite parts of the washing equipment for the first time. Previously the fruit had to set in the packing house a day or more for the rinse water to dry off before it could be graded and packed. You will see that in two seasons, considerable progress had been made in the development of washing equipment.

In 1927 the first commercial apple washers were introduced into the East in Southern New Jersey. That particular section has an unusual codling moth population, and extra cover sprays are applied.

This same year of 1927, the dry type of cleaning equipment of brushes and cloth wipers were actively introduced in the East and installed in considerable numbers in some of the Eastern sections, particularly the Shenandoah-Cumberland section of Virginia and the adjoining states of Maryland, Pennsylvania and New Jersey. With the lighter spray schedules of the East and application of less amounts of material per tree, this type of cleaning equipment was sufficient for most requirements. Additional units of these dry cleaners and polishers were installed in the East in the seasons of '28 and '29. Likewise, additional installations of commercial washers were made in these years at widely separated points. The seasons of 1928 and '29 saw many additional improvements in washing equipment made in the Northwest, and practically a uniform adoption of the washing method of spray residue removal. The dry type of cleaning equipment already in use was usually installed between the washer and grader, and served both as a drying and polishing unit.

Present

With the beginning of the 1930 season, indications were that officials of the United States Food and Drugs division would reduce the domestic spray residue tolerance. The official order on this change was issued early in 1930, and this brought the spray residue matter squarely before Eastern fruit growers. Fortunately, there were enough installations of washing equipment at different points in the East to demonstrate the adaptability of the process and the equipment to our conditions.

As a rule, residues were not as heavy as in the Northwest, but fruit was smaller and packed through a longer season. Michigan had had the experience of having several cars of fruit rejected in the winter of 1929-30 and the cooperative packing houses of the Western part of the state took steps early in the season to equip for washing. Practically all of these cooperative houses installed equipment to handle at least part of their volume, and in some cases all fruit passing through the houses was washed, regardless of the

spray schedule or amount of residue on the fruit. Southern Illinois growers had fruit rejected when they began to pack and ship Transparent and Duchess in July of 1930. Several washers were installed in this section and a considerable quantity of fruit washed in the 1930 season.

The Shenandoah-Cumberland section of Virginia depends on the export market for disposal of the smaller sizes of several varieties of fruit, and practically all of their Albemarle Pippins go to the British Isles. All fruit going abroad must meet the International tolerance of .01 and in August it was realized that residues were heavy and that the dry type of cleaning would not be sufficient in all cases. A considerable number of commercial washers were ordered and installed in the larger packing houses of this section. A large part of the fruit in the Virginia section was washed before packing in 1930.

The washers that have been used in the East have been of the flood type and the diffused spray type. In both of these, the apples are not immersed in solution, but the solution pumped on the fruit in considerable volume. Several years' use of these principles has shown that when properly used, there is no injury to the fruit, either mechanical or chemical, and that there is a much improved appearance with the removal of all residues as well as surface dust and dirt.

Future

The removal of the other materials than spray residues is of almost equal importance, as much Eastern fruit goes on the market with accumulations of road dust, packing house dust and varying amounts of the black fungus following aphis infestation and in some seasons, the specking following leaf hopper infestation. This last blemish was serious in certain sections of the East this past season and one large orchard operating company installed washers in all their packing houses, more for the removal of the leaf hopper specking than any other factor.

Frequently severe losses are felt from aphis infection on apples and pear psylla on pears, even after the use of control measures. Much of this loss is from the black fungus which grows in the honeydew of the aphis and the psylla, and the streaking of the fruits from rains. This fruit can be restored to its original appearance by the washing process, as these residues are loosened by the hydrochloric acid solution and removed as the fruit passes through the towel type of dryers. While control measures should be carefully carried out, in case of partial failure much of the loss can be avoided if the fruit is washed.

With the increasing importance of the apple maggot infestation in some sections of New York and the present practice of mid-summer spray applications, the washing process again comes into prominence. Arsenical residues were satisfactorily removed from fruit carrying considerable amounts from the midsummer applications for apple maggot control.

The dryers are an important part of the washing equipment as they put the fruit in condition so that the sorters and packers can handle it without discomfort. Efficient dryers have been as difficult to devise as the washers and two common types are in use. One depends on very strong blast of air actually blowing the drops of water from the fruit. The other uses absorbent towels to remove the surplus rinse water. These towels are dried by running through a wringer right in the machine, similar to a clothes-wringer only much longer. Before the dryers were perfected serious delays occurred in the packing house while the fruit was standing from the rinse water to drain off.

Indications are that the drying operation will be of even more importance in the East than in the Northwest, because of the prevalence of apple scab. Many of you have had the experience of storing apples slightly infected with scab in common or even cold storage, and have scab grow and spread through the stored fruit throughout the storage season. The presence of moisture is necessary for the growth of the scab organism and scab-infected fruit, packed wet, no doubt will deteriorate in value from the increase of the scab spots.

We find as we attend the different state meetings, that the question in the mind of many growers is how this equipment can be installed in their present packing houses and used with their present equipment. If water is available, the problem is comparatively simple. The washers are simply placed ahead of the grader and the fruit passes automatically from the washer on to the receiving end of the grader. Your extension authorities will advise you the proper strength of washing materials and how to mix them. We would emphasize the importance of adequate rinsing and as a general principle, we would suggest the use of from two to three gallons of rinse water per bushel of fruit. Less quantities have been sufficient in many cases, but a thorough rinse is equally important with thorough washing. With dryers a unit of the washing equipment, there is no delay in the packing operation. The fruit comes to the sorters clean and bright, which fact facilitates the sorting operation.

The smaller models of washers are usually operated by electric motors of from 3 to 5 H. P. or gasoline engines of around 8 to 10 H. P. The larger models use from 7½ to 10 H. P. electric motors or gasoline engines of from 15 to 20 H. P. Tractors furnish a good source of power for these large model washers, where electricity is not available. Water under pressure is not necessary for rinsing, as the washers are equipped with pumps for circulating the rinse water. Drainage away from the washers is important and they should not be drained into any stream having a fish population.

The future of the washing process and washing equipment will be largely one of adaptation to the individual problems in the different sections. The sections were late season spraying is heavier will operate their washers somewhat slower and perhaps with increased strength of solution. The sections with lighter spraying schedules will be able to operate somewhat faster and perhaps use weaker solutions. The washing process is not primarily a cooperative packing house proposition, but an individual problem the same as your pruning, spraying, fertilizing, packing and selling operations. Washing equipment is now available in sizes within the reach of all commercial growers and indications are that washing will become an accepted part of fruit handling operations in the East, the same as it has in the Northwest in the last four years. The market is showing a preference for clean fruit and the washing will place Eastern fruit in better position to compete with the closely graded, carefully sized fruit of the Northwest, as well as with other fruits always in competition with our apples.

Reprint from the 1931 Proceedings of the New York State Horticultural Society.

THE FRUIT PACKING HOUSE

A. F. VIERHELLER, *Extension Horticulturist, College Park, Maryland.*

Very little has been written or spoken about fruit packing houses and their general arrangement. Probably the reason for this is that no two growers would agree upon any certain plan of house, because their operations or conditions are different.

It seems that the older packing house were built with the idea that packing was a minor detail, consequently little attention was paid to arrangement or construction. Most of the older houses were built with an overhead loft or storage for barrels, baskets and packing material, and the grader was often placed in such a position that fruit came in at one end or side of the building, then was run over the grader and loaded into the car, or stacked up in the corner. In many cases, the grader and sorting tables were placed where natural daylight was missing, and defects on fruit were to be seen with difficulty. Electric lights were placed in some of the houses to improve the lighting, but in many instances the lights were glaring in the eyes of the workers or were located so unsatisfactorily that there was still considerable defective fruit getting by and being packed. Proper lighting of a grader or even of any house is a problem, but such arrangements as several shaded electric lights or lights concealed in an inverted trough reflector, placed a few feet above the sorting belt, are giving good results.

Following the two story type of house, came a house with a pit in the lower floor, where the graders were placed, and the hoppers where fruit entered the grading machine were almost level with the unloading platform to which fruit was brought in from the orchard. The objection here was that packed fruit had to be lifted from the pit to the platform to be loaded into the cars. To overcome this, the pits were removed from some of the houses and the grading machines were elevated and then equipped with mechanical elevators for dumping barrels or field crates upon the receiving hopper of the grading machine, but this was rather rough treatment. Gradually, the roller chain elevator came into use and served also as a sorting belt.

Then came a period of all sorts of changes in construction of the packing house. The overhead storage space was moved to one end or one side of the house, or even removed entirely, so as to allow for more daylight. The upper floor of the packing house was removed, and large windows and plenty of them, were provided. In some low roofed sheds flat skylights were added or ridge skylights were built on. The later sheds were built on slopes where a basement could be used. At the present time, the tendency is to have the unloading or receiving platform built so as to be flush with the bed floor of the trucks or wagons that bring the fruit from the orchards. From here it is fed into the washer, brusher, or grader belt. In some houses the grading and packing floor is several feet lower than this platform. In others, the entire floor is level and roller chains carry the fruit up to the grader, which is several feet above the floor. After packing, the fruit goes either into the car, or, in houses where a basement is used, the packed barrels or baskets are sent to the basement by automatic gravity elevators, chutes or roller conveyors, where they are either stored or loaded into trucks or cars. Some of the later types of packing houses have well insulated storage cellars, that may be cooled by refrigeration, if necessary. It is possible that at some future time, fruit will be cooled at the packing houses and will be kept cool until it reaches

the market, whether here or abroad.

From the above discussion, we might describe a good type of packing house as one where fruit, either packed or unpacked, is subjected to the least handling. This is labor saving, but above all, it reduces the jolts and rough handling of fruit that causes bruising. In such a house, natural lighting is used to best advantage, and the fruit moves through the house quickly and in orderly fashion.

Now let us look at the human side of fruit packing. The grower must use whatever packing labor he can afford, or whatever he can get. Then comes the period of training this hired help and finding out which men or women are adapted to certain packing operations.

Of course, if working conditions are made reasonably comfortable, it will help to keep the employees contented and efficient. In some houses, the employees along the sorter belt are seated, but most growers feel that the employees can work better if they are standing. There are many things to distract the attention of those who work at the sorter belt. The sole duty of these people is to pick out defective fruit, "facers," etc., and it is really a difficult matter to place these workers so that they won't "visit," or be crowded, or take their eyes off their work. Too many or too few workers at this point will cause confusion or else allow considerable bad fruit to reach the barrel or basket. In 1930, some growers using too few people in sorting their fruit were surprised to see some of the fruit that "got by," but was found by the inspector.

In visiting packing houses of all types, many small things may be noted, that are not so insignificant as they may seem. There are still exposed gears and chains that should be covered to prevent accident and injury. Some graders are geared a little too high, and there is not enough help to handle the fruit properly, as it comes through so rapidly. Some packing houses have filling bins too small, and some have large bins where fruit rolls rapidly from the grader and come to a sudden stop with a thud as it reaches the lower end of the bin. This means bruising, and it may be reduced by having a flap of carpet or burlap hung across the bin so as to reduce the rolling speed of the fruit as it runs under this flap.

The use of padding on all parts of the grading machine is an excellent practice, and yet it is peculiar that we all hate to tack a few pads of carpet, burlap, or pieces of old automobile tire or tube where we know that these are needed. There are bound to be exposed bolt heads, sharp corners or spots on almost any grader where fruit can be damaged, and where pads would help to reduce this damage.

Changing conditions of the fruit market are bringing gradual changes in packing equipment. The fruit wiper and the brusher have come into more general use within the past few years. Such machines will remove a part of the dirt and residue from fruit, but no manufacturer claims that these machines will remove all residue. With the reduction of domestic arsenical residue tolerance to .012 grains per pound of fruit, the grower should be prepared to clean the wiper or brusher at least twice a day, so that the machine can clean the fruit efficiently. This will mean several sets of "rags" where the wiper is used, or the use of soap and water for cleaning the brushing machine. The rags from the wiper may be washed, dried and replaced, as the soiled rags are removed from the machine. Fruit washers have proved their value, and more of these machines may be installed as conditions warrant their use.

We have heard considerable comment about "slack" packages on both the export and domestic markets. The remedy, so far as we know, seems to lie in proper "racking" as the fruit is run into the package. All types of mechanical basket turners are equipped with racking devices, and there is no occasion to drop the filled basket on the floor to "make it solid." Barrels should be racked several times as the fruit is run into them. This calls for a racking block, of either concrete or 2 x 8 inch timbers set on edge and nailed solidly together so that the block will be 8 inches deep and about 30 inches square. Such blocks are best set into the ground, but if there is a basement to the packing house, a supporting post under the block will help make it solid. If a barrel of apples is not thoroughly racked, no amount of pressing will give a permanent tight pack to the barrel. A barrel press was never intended to be used as a cider press in making a tight pack.

Little mention has been made, up to this point, regarding the use of grading machines, and types to be used. There are on the market various types of hand and power machines that size fruit by weight of the various sizes, by use of sizing chains, converging rollers, endless chain rollers, and belt and roller combinations, all of which have their uses, and adaptations. It is a comparatively simple matter for any fruit grower to select a machine of a type, size, capacity and price that will meet his packing requirements.

Within the past few years, groups of growers in various states have formed cooperative organizations which provide larger packing houses where the fruit of the member growers is packed. Such a system offers advantages of having better equipment and of improving the marketing methods.

The United States Department of Agriculture has published a bulletin on packing house arrangement. This pamphlet, Farmers Bulletin No. 1080, may be obtained from the Office of Information, U. S. Department of Agriculture, Washington, D. C.

Probably the grower who grows and packs a comparatively small crop of only a few thousand bushels will feel that little has been discussed here, that would apply to his packing equipment and operations. Many such growers who have small packing sheds, pick and haul the fruit to the shed and pack it as soon as they can get to it. It is not necessary for them to use much extra hired help, unless they have quick sale for their fruit, but they should try to pack and store their fruit as soon after picking as possible. The main objective of these men, or of any fruit grower, for that matter, should be to pack at least possible cost, a neat, well-sorted and carefully sized pack of fruit. This would mean careful picking and handling to avoid bruises; adequate and suitable storage space for packed and unpacked fruit; sufficient use of daylight so that defects can be seen when fruit is being sorted, and the elimination of unnecessary handling of fruit by use of any little labor-saving devices. Such things as forms for ring facing baskets, mechanical basket turners, etc., seem to be necessities for quick and satisfactory packing. Many growers do not use sizing machines or "graders," but in the trade where price runs according to size of fruit, the use of a sizer will pay for itself in a short time and will give a more attractive, uniform pack.

Now is the time to think of the packing season. Growers desiring the names of manufacturers of sizing machines should write to the Extension Service, or the Department of Horticulture, University of Maryland, College Park, for this information. Get these manufacturers' catalogs and look them over.

The practical results of careful handling of fruit during packing operations, of getting the fruit through the packing house as soon as possible and of immediate storage or cooling of packed fruit are shown in Bulletin 350, published by Illinois Agricultural Experiment Station, Urbana, Illinois. The bulletin reports that careful handling, proper packing, the use of basket liners and immediate cooling, especially of such apple varieties as Transparent and Duchess, gave a packed product that brought a better price because of better condition of maturity and less bruising. Apparently the old adage "Handle apples like eggs," is as true in the packing house as it is in the orchard when the apples are picked.

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Put Life In Your Orchard

Don't wait for your orchard to show these signs: "Fruit spur and terminal growth is short, the bark becomes tight, the fruit doesn't size up, much of the fruit cracks during summer when dry spells are followed by rains, die-back or rosette appears on the terminals, more top and root injuries occur in winter, and in many cases the addition of nitrogen fertlizers gives very little response."

These are the indications your orchard gives you that you should immediately turn your attention to getting more organic matter in your soil. "It is the only way to permanently improve the soil and prevent the occurence of such troubles."

SOD ORCHARDS: Test soils and apply lime as needed. "Whatever fertilizers are needed for improving the growth of the sod should be added. This may mean a high grade complete fertilizer consisting of Nitrogen, Phosphorus and Potash."

CULTIVATED ORCHARDS: Test soils and apply lime as needed. "Nitrogen, Phosphorus and Potash will probably all have to be added on many soils to get a heavy growth of cover crops."

It will pay you to use liberal amounts of high grade complete fertilizer to get the organic matter which puts **"LIFE"** in your orchard soils. For further information write to

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